

REMARKS

This communication is in response to the Action of April 27, 2005. In that Action, claims 1 through 22 were rejected.

The applicants have amended claim 1 to correct inadvertent errors therein and to clarify the meaning thereof, and have further amended claim 12 to correct inadvertent errors therein. In addition, the applicants have amended the specification to correct inadvertent errors and omissions therein.

The Examiner begins by objecting to claim 1 because of the shortened phrase therein following a longer antecedent phrase. The applicants believe the above amendment has overcome this objection.

The Examiner next rejects claims 1 through 11 under 35 U.S.C. 112 as being indefinite because of the recitation of two different diameters therein leading to the Examiner finding the resulting meaning of the claim to be unclear.

The applicants have amended claim 1 to indicate that these two different diameters correspond in each being different diameters of the walls with the "effective joined inner diameter" being the diameter at the intersection between the walls and the end region wall portions, and the effective operation inner diameter being the diameter over the separation length. The applicants believe that this amendment has overcome this rejection.

The Examiner next rejects claims 1 through 22 under 35 U.S.C. 103 as being obvious in face of U.S. Patent 6,300,729 to Keijser et al. taken in view of U.S. Patent 6,724,144 to Takeji et al. The Examiner appears to contend that the Keijser reference shows the metal halide lamps of the present invention except for (a) not having smooth intersections of inner surfaces of the end region wall portions and planes extending therethrough containing centers of the electrodes with these intersections having radii of curvature along them that is equal or less than half of that corresponding effective joined diameter; and with these surfaces being separated from the electrodes by more than one millimeter, and for (b) not having hemispherical shape end regions with inner surfaces of a radius equal to half of the walls inner diameter with the surfaces separated from the electrodes by

more than 1 millimeter. These deficiencies of the Keijser reference the Examiner finds to be supplied by the Takeji reference disclosure in Figures 3 and 4 thereof. With these contentions, the applicants must respectfully disagree.

This disagreement in connection with present claim 1 is based on the requirement therein that the arc discharge chamber inner surfaces at the intersections thereof with planes passing through the electrodes be smooth intersections as can be seen to be the situation for the arc discharge chambers of the present invention with respect to the examples shown in Figures 2 and 5 of the present application. In fact, both the inner and the outer surfaces of the arc discharge chambers 20 and 20' are similarly smooth since they substantially parallel one another in the absence of any significant thickness differences anywhere in the walls of these arc discharge chambers. The importance of this arrangement is pointed out in the description in the present specification in statements that additional material in the arc discharge chamber wall structures, such as that arising at corners provided in such wall structures, leads to increased heat loss at those locations which in turn reduces the temperature in the vicinity of those locations resulting in corresponding "cold spots" thereabout. Such "cold spots" are to be avoided because they lead to reducing vapor pressures of ionizable materials in the chambers and so corresponding decreases in the emitted light radiation.

Such corners, and the unavoidable accompanying added structural materials, are found, however, in both (a) the Keijser reference as conceded by the Examiner, where main chamber walls 31 are joined with end caps 32a and 32b which in turn seal ceramic projecting plugs 34 and 35, and in (b) the Takeji reference where main tube body 11 is joined at both ends by terminal plate 13 to corresponding narrow tubes 12. That is, terminal plates 13 in the Takeji reference arc tube form right angle interior corners where they are joined with main tube body 11, and further form exterior corners where they are joined with narrow tubes 12 near electrodes 22. These corners prevent the intersections with planes passing through electrodes 22 at the inner surfaces of narrow tubes 12, terminal plates 13 and main tube body 11 from being smooth since such intersections make sharp, approximately right angle directional changes at those corners. The added material which comes about because of these corners can be seen, for instance, by considering diagonals from the

interior end of narrow tube 12 across terminal plate 13 to the outer end of main tube body 11 which is considerably longer, and therefore passes through more material, than the minimum distance between the inner and outer surfaces of the walls of main tube body 11 anywhere else, and so will result in "cold spots" in the vicinity of terminal plates 13 during lamp operations. In these circumstances, the applicants respectfully submit that claim 1 is clearly allowable over both the Keijser and the Takeji references, and therefore the claims depending on claim 1 should also be allowable.

As to the rejection of claim 12, the Examiner concedes that the Keijser reference does not have end structures in its discharge vessel with a hemispherical shape but also, contrary to the Examiner's contention, neither does the arc tube of the Takeji reference which is stated therein to have main arc tube body 11 with a large diameter portion 11A extending into a tapered portion 11B at both ends thereof "formed in a cylinder having a smaller diameter toward the forward end thereof", and these tapered portions further extending into a smaller diameter portion 11C formed in a true cylinder. Clearly, there is no hemispherical shape end in the Takeji reference arc tube. In the absence of hemispherical shape ends, there can be no extensive inner surface of the ends having a radius everywhere equal to half the inner diameter of the chamber wall sides cylinder inner diameter.

Furthermore, the Keijser and the Takeji references are incompatible with one another with respect to the claim 12 ratio limitation thus preventing a reasonable combination of the two. Although the Keijser reference has a separation to inner diameter ratio greater than two, the Takeji reference does not. In these circumstances, too, the applicants respectfully submit that claim 1 is clearly allowable over both the Keijser and the Takeji references, and therefore the claims depending on claim 1 should also be allowable.

In view of the foregoing, the applicants respectfully request that the Examiner reconsider his rejection of claims 1 through 22 as amended, and further request that these claims as amended now be allowed.

The Commissioner is authorized to charge any additional fees associated with this

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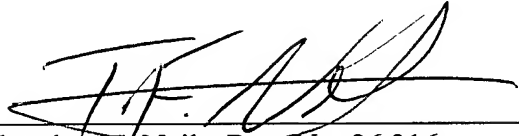
Respectfully submitted,

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